

CLAIMSWhat is claimed is:

1. A catalytic system comprising:  
a ceramic support comprising alumina, said ceramic support having a surface that comprises an adhesive agent located at said surface, said adhesive agent being selected from the group consisting of titanium, zirconium, scandium, hafnium, lanthanum, and yttrium; and  
a plurality of metal catalyst particles attached to the surface of said ceramic support.
2. A catalytic system according to claim 1 wherein said ceramic support is in the shape of a particle.
3. A catalytic system according to claim 1 wherein said metal catalyst particles are selected from the group consisting of nickel, palladium and platinum.
4. A catalytic system according to claim 1 wherein said adhesive agent is in the form of a  $\frac{1}{4}$  to  $\frac{3}{4}$  monolayer on said surface.
5. A catalytic system according to claim 1 wherein said adhesive agent is selected from the group consisting of titanium, zirconium, yttrium and scandium.
6. A catalytic system according to claim 1 wherein two or more adhesive agents are present at the surface of said support.
7. A catalytic system according to claim 1 which comprises a monolith having a surface comprising metal on which said ceramic support is attached.
8. A catalytic system according to claim 2 which comprises a monolith having a surface comprising metal on which said oxide ceramic support is attached.
9. A method for making a catalytic system comprising the steps of:  
providing a ceramic support comprising alumina, said ceramic support having a surface;

treating said surface with an adhesive agent to provide a modified surface that is doped with said adhesive agent, said adhesive agent being selected from the group consisting of titanium, zirconium, scandium, hafnium, lanthanum and yttrium; and

attaching a plurality of metal catalyst particles to the modified surface of said ceramic support to provide a supported metal catalyst.

10. A method for making a catalytic system according to claim 9 wherein said ceramic support is in the shape of a particle.

11. A method for making a catalytic system according to claim 9 wherein said metal catalyst particles are selected from the group consisting of nickel, palladium and platinum.

12. A method for making a catalytic system according to claim 9 wherein said adhesive agent is in the form of a  $\frac{1}{4}$  to  $\frac{3}{4}$  monolayer on said surface.

13. A method for making a catalytic system according to claim 9 wherein said adhesive agent is selected from the group consisting of titanium, zirconium, yttrium and scandium.

14. A method for making a catalytic system according to claim 1 wherein two or more adhesive agents are present at the surface of said support.

15. A method for making a catalytic system according to claim 9 that includes the additional step of attaching said supported metal catalyst to a metallic monolith structure.

16. A method for making a catalytic system according to claim 10 that includes the additional step of attaching said supported metal catalyst to a metallic monolith structure.

17. In a catalytic system comprising a ceramic support that comprises alumina, said ceramic support having a surface to which metal catalyst particles are attached, the improvement comprises increasing the adhesion between said metal

catalyst particles and said ceramic support by doping the surface of said support with an adhesive agent, said adhesive agent being selected from the group consisting of titanium, zirconium, scandium, hafnium, lanthanum and yttrium.

18. An improved catalytic system according to claim 15 wherein said ceramic support is in the shape of a particle.

19. An improved catalytic system according to claim 15 wherein said metal catalyst particles are selected from the group consisting of nickel, palladium and platinum.

20. An improved catalytic system according to claim 15 wherein said adhesive agent is in the form of a  $\frac{1}{4}$  to  $\frac{3}{4}$  monolayer on said surface.

21. An improved catalytic system according to claim 15 wherein said adhesive agent is selected from the group consisting of titanium, zirconium, yttrium and scandium.

22. An improved catalytic system according to 17 which further includes a metallic monolith having a surface to which said ceramic support is attached, the improvement comprising increasing the adhesion between the surface of said monolith and said ceramic support by doping the surface of said support with an adhesive agent, said adhesive agent being selected from the group consisting of titanium, zirconium, scandium, hafnium, lanthanum and yttrium.

23. An improved catalytic system according to claim 18 wherein said ceramic support is in the shape of a particle.